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a second positioning arrangement provided on one of the rotor, the stator and a fastening element;  
wherein the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing, and wherein the first positioning arrangement includes at least one integral projection that projects beyond at least one side surface, wherein the projection is one of lenticular and conical, the second positioning arrangement including a recess formed in one of the stator, the rotor and the fastening element, the at least one integral projection being engageable in the recess.

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## **REMARKS**

### **I. Introduction**

Claims 1 to 14 are pending in the present application. In view of the foregoing amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

Applicants note with appreciation the acknowledgment of the claim for foreign priority and the indication that all certified copies of the priority documents have been received.

### **II. Rejection of Claims 1, 3 to 5, 10, 11 and 14 Under 35 U.S.C. § 103(a)**

Claims 1, 3 to 5, 10, 11 and 14 stand rejected under 35 U.S.C. 103(a) as unpatentable over U.S. Patent No. 6,302,400 ("Werner et al.") and U.S. Patent No. 5,066,025 ("Hanrahan"). Applicants respectfully submit that the combination of Werner et al. and Hanrahan does not render obvious claims 1, 3 to 5, 10, 11 and 14 for the following reasons.

Claim 1 relates to a brush seal for sealing a rotor with respect to a stator. Claim 1 recites that the brush seal comprises a bristle housing configured to be arranged on a first one of the rotor and the stator, the bristle housing including a cover plate, a supporting plate, a circumferential surface and two side surfaces. Claim 1 also

recites that the brush seal includes bristles fastened in the bristle housing, the bristles including free ends oriented toward a second one of the rotor and the stator. Claim 1 further recites that the brush seal includes a first positioning arrangement provided on at least one of the circumferential section and at least one side surface, and a second positioning arrangement provided on one of the rotor, the stator and a fastening element. Claim 1 recites that the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing.

Werner et al. purport to relate to a brush seal for sealing a rotor against a housing. According to Werner et al., the brush seal includes a front panel and a supporting plate attached to the housing wherein a number of bristles are disposed between the front panel and supporting plate. Werner et al. state that a seal housing that defines a fit surface is formed by cold joining the front panel and supporting plate, and that the front panel or the supporting plate include a beaded lip for firmly joining the front panel to the supporting plate.

Hanrahan purports to relate to a support structure that includes a recess which accepts a short plate of a brush seal but will not accept a long plate of the brush seal. Furthermore, Hanrahan purports to describe a retaining ring groove that accepts the retaining ring only if the seal is installed in the proper direction. Hanrahan also purports that, in accordance with this arrangement, reverse installation of the brush seal is precluded without special machining of the brush seal.

With respect to claims 1, 3 to 5, 10 and 11, the Final Office Action contends that Werner et al. disclose various features of the claimed invention but admits that "Werner [et al.] fail[ ] to disclose a positive-locking arrangement between the first positioning element and the second positioning element." Final Office Action at p. 2. However, the Final Office Action contends that "Hanrahan teaches a brush seal as prior art . . . having a positively locking . . . first positioning element . . . with a second positioning element . . . for the purpose of preventing incorrect installation of the assembly, [and that] it would have been obvious to one having ordinary skill in the art at the time the invention was made to add a positively locking feature to Wilson's invention to prevent misassembly." Final Office Action at pp. 2 to 3.

As an initial matter, Applicants respectfully submit that Werner et al. cannot be used to reject the present claims under 35 U.S.C. § 103(a). The present application was filed in the U.S. Patent and Trademark Office on **April 11, 2001**. Accordingly, the provisions of the American Inventors Protection Act of 1999 ("the AIPA"), Pub. L. 106-113, 113 Stat. 1501 (1999), are applicable to the present application. The present application claims priority to German Patent Application No. 100 18 273.9, filed on **April 12, 2000**.

U.S. Patent No. 6,302,400 issued on **October 16, 2001**, from U.S. Patent Application Serial No. 09/423,910, filed under 35 U.S.C. § 371 on **February 17, 2000**, from International Application No. PCT/DE98/01197. Accordingly, U.S. Patent No. 6,302,400 does not qualify as prior art against the present application under 35 U.S.C. § 102(e) as amended by the AIPA. See also M.P.E.P. §§ 706.02(a) and 2136.03. In addition, even if U.S. Patent No. 6,302,400 does qualify as prior art against the present application under 35 U.S.C. § 102(e), which it does not, 35 U.S.C. § 103(c), as amended by the AIPA, provides:

Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

The present application is assigned to MTU Aero Engines GmbH pursuant to an assignment executed on May 2, 2001 and recorded in the U.S. Patent and Trademark Office on June 11, 2001, at Reel 011880, Frame 0339. U.S. Patent No. 6,302,400 is assigned to MTU Motoren-und Turbinen-Union München GmbH pursuant to an assignment recorded in the U.S. Patent and Trademark Office on March 17, 2000 at Reel 010607, Frame 0276. "MTU Motoren-und Turbinen-Union München GmbH" is the prior business name of MTU Aero Engines GmbH, assignee of the present application. Accordingly, pursuant to 35 U.S.C. § 103(c), as amended by the AIPA, U.S. Patent No. 6,302,400 cannot be used to reject the present claims under 35 U.S.C. § 103(a). Withdrawal of this rejection is therefore respectfully requested for at least this reason.

Furthermore, even if the Examiner disagrees that Werner et al. cannot be used to reject the present claims under 35 U.S.C. § 103(a), Applicants respectfully

submit that the combination of Werner et al. and Hanrahan does not render obvious claim 1 for at least the reason that the combination of Werner et al. and Hanrahan fails to disclose, or even suggest, all of the limitations recited in claim 1. For example, the combination of Werner et al. and Hanrahan fails to disclose, or even suggest, that the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing, as recited in amended claim 1. With respect to Werner et al., the Final Office Action identifies beaded lip 7 and circumferential surface 9 as first and second positioning elements, respectively. In addition, with respect to Hanrahan, the Final Office Action identifies lip 30 and recess 32 as a first positioning element and static structure 12 as a second positioning element. However, neither of these arrangements describe first and second positioning elements that interact with each other, let alone interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing. For instance, in Werner et al., beaded lip 7 does not interact with circumferential surface 9. Likewise, in Hanrahan, lip 30 and recess 32 do not interact with static structure 12. Furthermore, none of these elements interact with each other to provide the combined benefit of positive locking and definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing.

To establish prima facie obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. In re Merck & Co., Inc., 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). Since the combination of Werner et al. and Hanrahan does not disclose, or even suggest, all of the limitations of claim 1 as more fully set forth above, it is respectfully submitted that the combination of Werner et al. and Hanrahan does not render obvious claim 1.

Moreover, it is respectfully submitted that the cases of In re Fine, supra, and In re Jones, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992), make plain that the Final Office Action's generalized assertions that it would have been obvious to modify or combine the reference do not properly support a § 103 rejection. It is respectfully submitted that those cases make plain that the Final Office Action reflects a subjective "obvious to try" standard, and therefore does not reflect the proper evidence to support an obviousness rejection based on the references relied upon. In particular, the Court in the case of In re Fine stated that:

The PTO has the burden under section 103 to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. This it has not done. . . .

**Instead, the Examiner relies on hindsight in reaching his obviousness determination. . . . One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.**

In re Fine, 5 U.S.P.Q.2d at 1598 to 1600 (citations omitted; italics in original; emphasis added). Likewise, the Court in the case of In re Jones stated that:

Before the PTO may combine the disclosures of two or more prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. . . .

**Conspicuously missing from this record is any evidence, other than the PTO's speculation (if it be called evidence) that one of ordinary skill . . . would have been motivated to make the modifications . . . necessary to arrive at the claimed [invention].**

In re Jones, 21 U.S.P.Q.2d at 1943, 1944 (citations omitted; italics in original).

That is exactly the case here since it is believed and respectfully submitted that the present Final Office Action offers no evidence whatsoever, but only conclusory hindsight, reconstruction and speculation, which these cases have indicated

does not constitute evidence that will support a proper obviousness finding.

Unsupported assertions are not evidence as to why a person having ordinary skill in the art would be motivated to modify or combine references to provide the claimed subject matter of the claims to address the problems met thereby. Accordingly, the Office must provide proper evidence of a motivation for modifying or combining the references to provide the claimed subject matter.

More recently, the Federal Circuit in the case of In re Kotzab has made plain that even if a claim concerns a “technologically simple concept” -- which is not the case here -- there still must be some finding as to the “specific understanding or principle within the knowledge of a skilled artisan” that would motivate a person having no knowledge of the claimed subject matter to “make the combination in the manner claimed,” stating that:

In this case, the Examiner and the Board fell into the hindsight trap. The idea of a single sensor controlling multiple valves, as opposed to multiple sensors controlling multiple valves, is a technologically simple concept. With this simple concept in mind, the Patent and Trademark Office found prior art statements that in the abstract appeared to suggest the claimed limitation. But, there was no finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of Kotzab’s invention to make the combination in the manner claimed. In light of our holding of the absence of a motivation to combine the teachings in Evans, we conclude that the Board did not make out a proper prima facie case of obviousness in rejecting [the] claims . . . under 35 U.S.C. Section 103(a) over Evans.

In re Kotzab, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000) (emphasis added). Again, it is believed that there have been no such findings.

Therefore, Applicants respectfully submit that the combination of Werner et al. and Hanrahan does not render obvious claim 1. Withdrawal of this rejection is therefore respectfully requested.

In addition, Applicants respectfully submit that claims 3 to 5, 10, 11 and 14, which ultimately depend from claim 1 and therefore include all of the limitations of claim 1, are also not rendered unpatentable by the combination of Werner et al. and Hanrahan for at least the same reasons given above in support of the patentability of

claim 1. In re Fine, supra (any dependent claim depending from a non-obvious independent claim is non-obvious).

**III. Rejection of Claims 2 and 6 to 9 Under 35 U.S.C. § 103(a)**

Claims 2 and 6 to 9 were rejected under 35 U.S.C. § 103(a) as unpatentable over Werner et al. and Hanrahan, and further in view of U.S. Patent No. 6,106,190 ("Nakamura et al.") and U.S. Patent No. 3,042,159 ("Anderson"). Final Office Action at p. 3. It is respectfully submitted that the combination of Werner et al., Hanrahan, Nakamura et al. and Anderson does not render obvious claims 2 and 6 to 9 for the following reasons.

Claim 6 relates to a brush seal for sealing a rotor with respect to a stator. Claim 6 recites that the brush seal comprises a bristle housing configured to be arranged on a first one of the rotor and the stator, the bristle housing including a cover plate, a supporting plate, a circumferential surface and two side surfaces. Claim 6 also recites that the brush seal includes bristles fastened in the bristle housing, the bristles including free ends oriented toward a second one of the rotor and the stator. Claim 6 further recites that the brush seal includes a first positioning arrangement provided on at least one of the circumferential section and at least one side surface, and a second positioning arrangement provided on one of the rotor, the stator and a fastening element. Claim 6 recites that the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing. Claim 6 also recites that the first positioning arrangement includes at least one spot weld that projects beyond the circumferential surface, the second positioning arrangement including a recess formed in one of the stator and the rotor, the at least one spot weld being engageable in the recess.

Claim 9 relates to a brush seal for sealing a rotor with respect to a stator. Claim 9 recites that the brush seal comprises a bristle housing configured to be arranged on a first one of the rotor and the stator, the bristle housing including a cover plate, a supporting plate, a circumferential surface and two side surfaces. Claim 9 also recites that the brush seal includes bristles fastened in the bristle housing, the bristles including free ends oriented toward a second one of the rotor and the stator. Claim 9

further recites that the brush seal includes a first positioning arrangement provided on at least one of the circumferential section and at least one side surface, and a second positioning arrangement provided on one of the rotor, the stator and a fastening element. Claim 9 recites that the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing. Claim 9 also recites that the first positioning arrangement includes at least one integral projection that projects beyond at least one side surface, wherein the projection is one of lenticular and conical, the second positioning arrangement including a recess formed in one of the stator, the rotor and the fastening element, the at least one integral projection being engageable in the recess.

Anderson purports to relate to a contoured, spot-welded lap joint. Nakamura et al. describe a marine fender with a structure for fixing a pad to a fender frame, wherein the pad has at least one concavity formed in a front surface thereof, and a pad hole piercing the pad from a bottom of the concavity. Nakamura et al. state that a bolt with a head is inserted from a front side of the pad through the pad and fender holes, and a nut is disposed at a rear side of the fender frame to engage the bolt to thereby fix the pad to the fender frame. According to Nakamura et al., a washer is interposed between the head of the bolt and the bottom of the concavity. In case the bolt is attached to the fender frame, the nut is disposed in the concavity of the pad to engage the bolt, and the washer is interposed between the nut and the bottom of the concavity. Nakamura et al. purport that, in either case, the washer is disposed in the concavity such that a rim of the washer engages an inner periphery of the concavity to prevent rotation with each other, and the head of the bolt or nut is joined to the washer.

For the above stated reasons, Applicants respectfully maintain that U.S. Patent No. 6,302,400 does not constitute prior art against the present application, 35 U.S.C. § 102(e), and that, pursuant to 35 U.S.C. § 103(c) as amended by the AIPA, U.S. Patent No. 6,302,400 cannot be used to reject the present claims under 35 U.S.C. § 103(a). Furthermore, Applicants respectfully submit that the combination of Werner et al., Hanrahan, Nakamura et al. and Anderson does not render obvious claims 6 and 9 for at least the reason that the combination of Werner et al., Hanrahan, Nakamura et al. and Anderson fails to disclose, or even suggest, all of the limitations recited in claims 6



and 9. For example, the combination of Werner et al., Hanrahan, Nakamura et al. and Anderson fails to disclose, or even suggest, that the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing, as recited in amended claims 6 and 9. As more fully described above, neither Werner et al. nor Hanrahan describe such features. Furthermore, neither Nakamura et al. nor Anderson describe first and second positioning elements that interact with each other, let alone interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing.

Therefore, Applicants respectfully submit that the combination of Werner et al., Hanrahan, Nakamura et al. and Anderson does not render obvious claims 6 and 9. Withdrawal of the rejection of these claims is therefore respectfully requested.

In addition, Applicants respectfully submit that claims 2, 7 and 8, which depend from claim 1 and therefore include all of the limitations of claim 1, are also not rendered unpatentable by the combination of Werner et al., Hanrahan, Nakamura et al. and Anderson for at least the same reasons given above in support of the patentability of claim 1. In re Fine, supra (any dependent claim depending from a non-obvious independent claim is non-obvious).

#### **IV. Rejection of Claims 12 and 13 Under 35 U.S.C. § 103(a)**

Claim 12 and 13 were rejected under 35 U.S.C. § 103(a) as unpatentable over Werner et al. and Hanrahan, and further in view of U.S. Patent No. 5,066,024 ("Reisinger et al."). It is respectfully submitted that the combination of Werner et al., Hanrahan and Reisinger et al. does not render obvious claims 12 and 13 for the following reasons.

Reisinger et al. purport to relate to a brush-type seal that has a wire bundle which is bent in a U-shape and is surrounded by a radially inward slotted ring shaped tube and by a housing consisting of two connected support rings. According to Reisinger et al., application and maintenance of clamping forces is possible and is provided for to the ring shaped tube through the support rings, and attachments are provided on one supporting for fastening at a housing. Reisinger et al. state that the

support rings are connected by welding at a welding joint which is spaced from the slotted tube which directly contacts the wire bundle.

Claims 12 and 13 ultimately depend from claim 1 and therefore include all of the limitations of claim 1. Since claims 12 and 13 depend from independent claim 1, and since Reisinger et al. simply do not cure the critical deficiencies of Werner et al. and Hanrahan, as more fully described above, it is respectfully submitted that claim 12 and 13 is allowable for at least the same reasons that claim 1 is allowable. In re Fine, supra. Withdrawal of this rejection is therefore respectfully requested.

**V. Conclusion**

Attached hereto is a marked-up version of the changes made to the claims by the current Reply Under 37 C.F.R. §116. The attached pages are captioned **"Version with Markings to Show Changes Made."**

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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Dated: December 6, 2002

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PATENT TRADEMARK OFFICE

**Version with Markings to Show Changes Made**

**IN THE CLAIMS:**

Claims 1, 6 and 9 have been amended without prejudice as follows:

1. (Twice Amended) A brush seal for sealing a rotor with respect to a stator, comprising:

a bristle housing configured to be arranged on a first one of the rotor and the stator, the bristle housing including a cover plate, a supporting plate, a circumferential surface and two side surfaces;

bristles fastened in the bristle housing, the bristles including free ends oriented toward a second one of the rotor and the stator;

a first positioning arrangement provided on at least one of the circumferential surface and at least one side surface; and

a second positioning arrangement provided on one of the rotor, the stator and a fastening element;

wherein the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing.

6. (Twice Amended) A brush seal for sealing a rotor with respect to a stator, comprising:

a bristle housing configured to be arranged on a first one of the rotor and the stator, the bristle housing including a cover plate, a supporting plate, a circumferential surface and two side surfaces;

bristles fastened in the bristle housing, the bristles including free ends oriented toward a second one of the rotor and the stator;

a first positioning arrangement provided on at least one of the circumferential surface and at least one side surface; and

a second positioning arrangement provided on one of the rotor, the stator and a fastening element;

**Version with Markings to Show Changes Made**

wherein the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing, and wherein the first positioning arrangement includes at least one spot weld that projects beyond the circumferential surface, the second positioning arrangement including a recess formed in one of the stator and the rotor, the at least one spot weld being engageable in the recess.

9. (Twice Amended) A brush seal for sealing a rotor with respect to a stator, comprising:

- a bristle housing configured to be arranged on a first one of the rotor and the stator, the bristle housing including a cover plate, a supporting plate, a circumferential surface and two side surfaces;

- bristles fastened in the bristle housing, the bristles including free ends oriented toward a second one of the rotor and the stator;

- a first positioning arrangement provided on at least one of the circumferential surface and at least one side surface; and

- a second positioning arrangement provided on one of the rotor, the stator and a fastening element;

wherein the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and incorrect mounting of the bristle housing, and wherein the first positioning arrangement includes at least one integral projection that projects beyond at least one side surface, wherein the projection is one of lenticular and conical, the second positioning arrangement including a recess formed in one of the stator, the rotor and the fastening element, the at least one integral projection being engageable in the recess.